Docket No. Perox-Chelant

#2
P. Allen
07/01/02

IN THE UNITED STATES PATENT
AND
TRADEMARK OFFICE

APPLICANT: William L. Lundy

INVENTION: In Situ Subsurface Decontamination Method

INFORMATION DISCLOSURE STATEMENT PURSUANT TO 37 CFR 1.97

Accompanying this Information Disclosure Statement is PTO Form 1449 along with certain copies of the references cited in the specification or discussed hereafter. Copies of missing references will be supplied as soon as copies become available to Applicant's Attorney

John G. Premo
Reg. No. 17, 889
Date: 12/14/01

P10

Part of #2

PTO Form -1449 PATENT Sheet 1 of 1

DOCKET NO.	SERIAL NO.	APPLICANT	FILING DATE	GROUP
		William L. Lundy		

For: In Situ Subsurface Decontamination Method

U. S, PATENTS

EX. INITIALS PATENT NO. FILING DATE NAME CL. S/CL.

SEE EXHIBIT "A"

FOREIGN PATENTS

EXAMINER INITIALS PATENT NO. DATE COUNTRY CL. S/CL. TRANS.

NONE

OTHER DOCUMENTS

EXAMINER INITIALS

SEE EXHIBIT "B"

EXHIBIT "A"

William L. Lundy
For: In Situ—

4,294,703	10/1981	Wilms et al.	210/631
4,321,143	3/1982	Wilms et al.	210/631
4,370,241	1/1983	Junkermann et al.	210/759
4,591,443	5/1986	Brown et al.	210/747
4,604,214	8/1986	Carr et al.	210/759
4,724,084	2/1988	Pahmeier et al.	210/709
4,804,480	2/1989	Jayawant	210/759
5,043,080	8/1991	Cater et al.	210/748
5,266,214	11/1993	Safarzedeh-Amiri	210/748
5,286,141	2/1994	Vigneri	405/128
5,520,483	5/1996	Vigneri	405/128
5,525,008	6/1996	Wilson	405/128
5,611,642	3/1997	Wilson	405/128
5,610,065	3/1997	Kelly et al.	435/264
5,741,427	4/1998	Watts et al.	210/747
5,955,350	9/1999	Soni et al.	435/264
5,967,230	10/1999	Cooper et al.	166/245

(12) **United States Patent**
Kiest et al.

(10) **Patent No.: US 6,268,205 B1**
(45) **Date of Patent: Jul. 31, 2001**

(54) **SUBSURFACE DECONTAMINATION METHOD**

Martens et al. Caplus Abstract An: 1994:563163 of Feasibility of in situ chemical oxidation of refractile chlorinated organics by hydrogen peroxide-generated oxidative radicals

CKC

US005264018A

United States Patent [19]
Koenigsberg et al.

[11] **Patent Number: 5,264,018**
[45] **Date of Patent: Nov. 23, 1993**

[54] **USE OF METALLIC PEROXIDES IN BIORMEDIATION**

3031485 8/1980 Fed. Rep. of Germany .
49-117244 11/1974 Japan .
5333869 9/1936 [illegible]

US005395419A

United States Patent [19]
Farone et al.

[11] **Patent Number: 5,395,419**
[45] **Date of Patent: Mar. 7, 1995**

EXHIBIT "B"
William L. Lundy
For: In Situ—

OTHER PUBLICATIONS

Barbeni et al.; "Chemical Degradation of Chlorophenols with Fenton's Reagent"; Chemosphere, vol. 16, pp. 2225-2237, 1987

Bowers et al.; "Treatment of Toxic or Refractory Wastewaters with Hydrogen Peroxide"; Water Science & Technology, vol. 21, pp. 477-486, 1989

Brown et al.; "Competition between chelating agents and roots as factors affecting absorption of iron and other ions by plant species;" Plant Physiology, vol. 35, pp.878-886, 1960

Buxton et al.; "Critical Review of Rate Constants for Reactions of Hydrated Electrons, Hydrogen Atoms and Hydroxyl Radicals in Aqueous Solution"; Journal of Physical and Chemical Reference Data, vol. 17, pp. 513-531, 1988

Fent n; "Oxidation of Tartaric Acid in Presence of Iron"; Journal of the Chemical Society, vol. 65, pp. 899-910, 1894

Gates et al.; "In Situ Chemical Oxidation of Trichloroethylene Using Hydrogen Peroxide"; Journal of Environmental Engineering, vol. 121, pp. 639-644, 1995

Haag et al.; "Rate Constants for Reaction of Hydroxyl Radicals with Several Drinking Water Contaminants"; Environmental Science & Technology, vol. 26, pp. 1005-1013, 1992

Haber et al.; "Unpaarigkeit und Radikalketten im Reaktionsmechanismus Organischer und Enzymatischer Vorgänge"; Chemische Berichte, vol. 64, pp. 2884-2856, 1931

Haber et al.; "The Catalytic Decomposition of Hydrogen Peroxide by Iron Salts"; Proceedings of the Royal Society of London, Series A, 147, pp. 332-351, 1934

Halvorson et al.; "Equilibrium Relationships of Metal Chelates in Hydroponic Solutions"; Soil Science Society America Journal; vol. 36, pp.755-761, 1972

Hill et al.; "Rates of Solution of Limestone Using the Chelating Properties of Versene (EDTA) Compounds"; Kansas State Geological Survey, Bulletin No. 165, Part 7, 1963

Hill et al.; "Solubility of Twenty Minerals in Selected Versene (EDTA) Solutions"; Kansas State Geological Survey, Bulletin No. 175, Part 3, 1965

Kelly et al.; " Application of Fenton's Reagent as a Pretreatment Step in Biological Degradation of Aromatic Compounds"; Presented at the Institute of Gas Technology's Third International Symposium on Gas, Oil, Coal, and Environmental Biotechnology, New Orleans, LA, 1990

Kim et al.; "Enhancing Biological Treatability of Landfill Leachate by Chemical Oxidation"; Environmental Engineering Science, vol. 14, pp. 73-79, 1997

Lindsay et al.; "Devel pment f a DTPA Soil Test f r Zn, Fe, Mn and Cu"; Soil Science Society America Journal; vol. 42, pp.421-428, 1978

EXHIBIT "B"
William L. Lundy
For: In Situ—

Lindsay; "Chemical Equilibria in Soils"; chap. 15, 449 p., John Wiley & Sons, 1979

Lipcynska-Kochany et al.; "Influence of some Groundwater and Surface Water Constituents on the Degradation of 4-Chlorophenol by the Fenton Reaction"; Chemosphere, vol. 30, pp. 9-20, 1995

Norvell et al. "Reactions of EDTA Complexes of Fe, Zn, Mn and Cu with Soils"; Soil Science Society America Proceedings, vol. 33, pp. 86-91, 1969

Norvell et al.; "Reactions of DTPA Chelates of Fe, Zn, Cu and Mn with Soils"; Soil Science Society America Proceedings, vol. 36, pp. 778-783, 1972

Pignatello et al.; "Ferric Complexes as Catalysts for "Fenton" Degradation of 2,4-D and Metolachlor in Soil"; Journal of Environmental Quality, vol. 23, pp.365-370, 1994

Pradhan et al.; "Pilot-Scale Bioremediation of PAH-Contaminated Soils"; Applied Biochemistry and Biotechnology, vol. 63-65, pp. 759-773, 1997

Ravikumar et al.; "Effectiveness of Chemical Oxidation to Enhance the Biodegradation of Pentachlorophenol in Soil: A Laboratory Study"; Proceedings of the 23rd Mid-Atlantic Industrial Waste Conference, Technomic Publishing Inc., Lancaster, PA, pp. 211-221, 1991

Ravikumar et al.; "Chemical Oxidation of Chlorinated Organics by Hydrogen Peroxide in the Presence of Sand"; Environmental Science & Technology, vol. 28, 394-400, 1994

Rush et al.; "The Reaction between Ferrous Polyaminocarboxylate Complexes and Hydrogen Peroxide: An Investigation of the Reaction Intermediates by Stopped Flow Spectrophotometry"; Journal of Inorganic Biochemistry, vol. 29, pp. 199-215; 1987

Rush et al.; "Distinction between Hydroxyl Radical and Ferryl Species"; Methods in Enzymology, vol. 86, pp.148-156, 1990

Schirmann et al.; "Hydrogen Peroxide in Organic Chemistry"; chap. 5, 211 p., Edition Et Documentation Industrielle, 1979

Schnitzer et al.; "Soil Organic Matter"; chap. 1, 319 p., Elsevier, 1978

Schumb et al.; "Hydrogen Peroxide"; chaps 8 & 9, 759 p., American Chemical Society Monograph Series, 1955

Sedlak et al.; "Oxidation of Chlorobenzene with Fenton's Reagent"; Environmental Science & Technology, vol. 25, pp. 777-782, 1991

Sparks; "Soil Physical Chemistry"; chap. 4, 409 p., CRC Press, 1999

Sposito; "The Chemistry of Soils"; chaps. 4 & 5, 277 p., Oxford University Press, 1989

Stumm et al.; "Aquatic Chemistry, An Introduction Emphasizing Chemical Equlibria in Natural Waters"; Chap. 6, 583 p., John Wiley & Sons, 1970

Stumm et al.; "Aquatic Chemistry, Chemical Equilibria and Rates in Natural Waters"; chap. 7, 1022 p., John Wiley & S ns, 1996

EXHIBIT "B"

William L. Lundy
For: In Situ—

Thurmann; "Organic Geochemistry of Natural Waters"; chap. 11, 497 p., Kluwer Acad. Pub., 1985

Tyre et al.; "Treatment of Four Biorefractory Contaminants in Soils Using Catalyzed Hydrogen Peroxide"; Journal of Environmental Quality, vol. 20, pp. 832-838, 1991

Van Vleet et al.; "Input and Fate of Petroleum Hydrocarbons Entering the Providence River and Upper Narragansett Bay from Wastewater Effluents"; Environmental Science & Technology, vol. 11, pp. 1086-1092, 1977

Voelker et al.; "Effects of Fulvic Acid on Fe(II) Oxidation by Hydrogen Peroxide"; Environmental Science & Technology, vol. 30, pp. 1106-1114, 1996

Waite et al.; "Kinetics and Stoichiometry of Oxygen Release from Solid Peroxides"; Environmental Engineering Science, vol. 16, pp. 187-199, 1999

Walling; "Fenton's Reagent Revisited"; Accounts of Chemical Research, vol. 8, pp. 125-131, 1975

Walling et al.; "Fenton's Reagent. V. Hydroxylation and Side-Chain Cleavage of Aromatics"; Journal of the American Chemical Society, vol. 97, pp. 363-367, 1975

Walling et al.; "The Oxidation of Mandelic Acid by Fenton's Reagent"; Journal of the American Chemical Society, vol. 104, pp. 1185-1189, 1982

Watts et al.; "Treatment of Pentachlorophenol Contminated Soils using Fenton's Reagent"; Hazardous Waste Hazardous Materials, vol. 7, pp. 335-345, 1990

Watts et al.; "Treatment of Octachlorodibenzo-p-dioxin (OCDD) in Surface Soils Using Catalyzed Hydrogen Peroxide"; Chemosphere, vol. 23, pp. 949-956, 1991

Watts et al.; "Hydrogen Peroxide for Physico-Chemically Degrading Petroleum-Contaminated Soils"; Remediation, vol. 2, pp. 413-425, 1992